

Demystifying the MidFace



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Nothing to disclose

Objectives

- Where is the midface?
- Anatomy
 - Facial buttresses
 - Prerequisite to Le Fort
- Making **free** fragments:
 - Le Fort Classification
 - ZMC
- Search patterns



Upper Face, MidFace and Lower Face

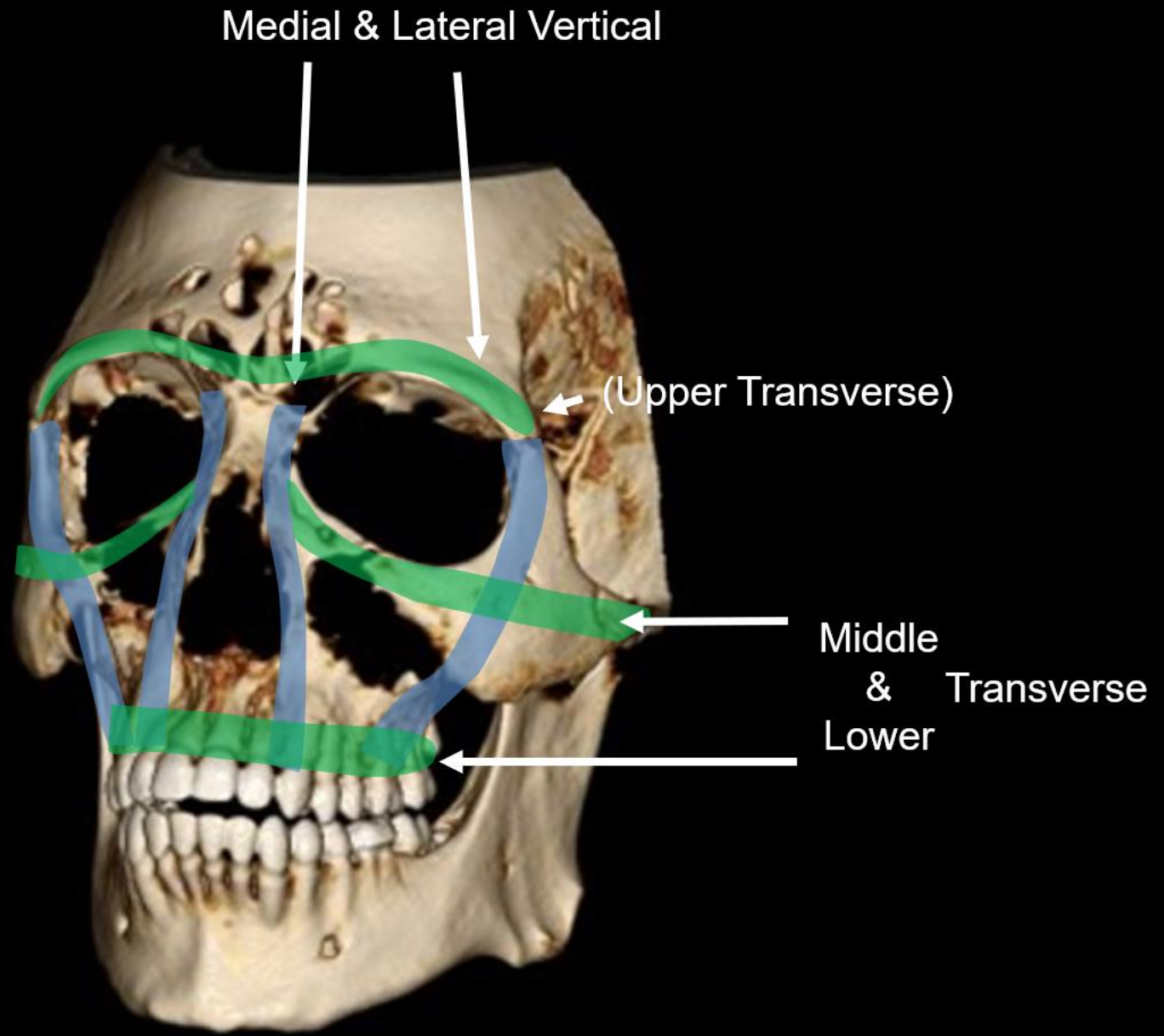
Frontal bone (and sinus)

Maxilla, zygoma, ethmoid and
nasal bones

Mandible

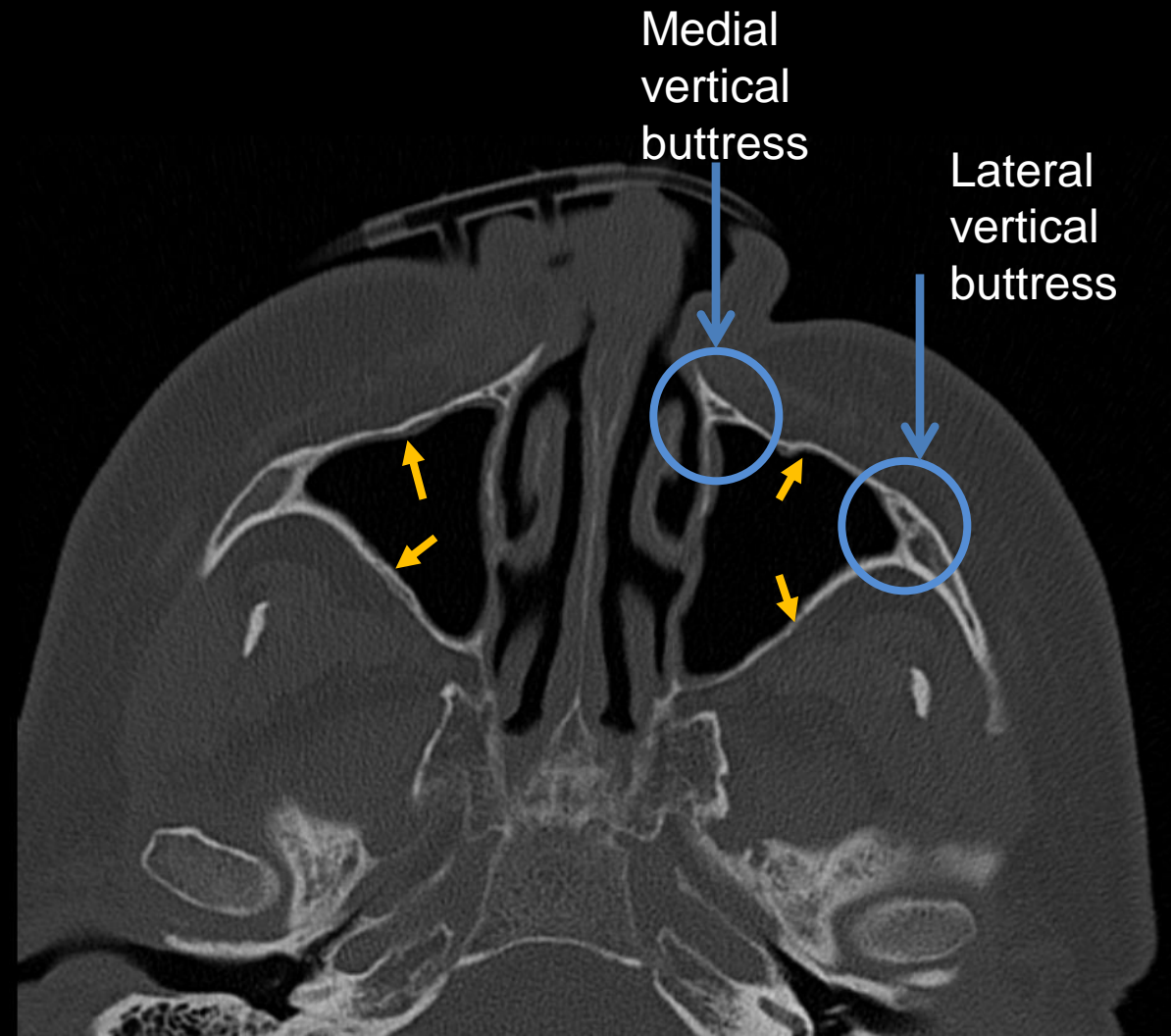


Buttresses



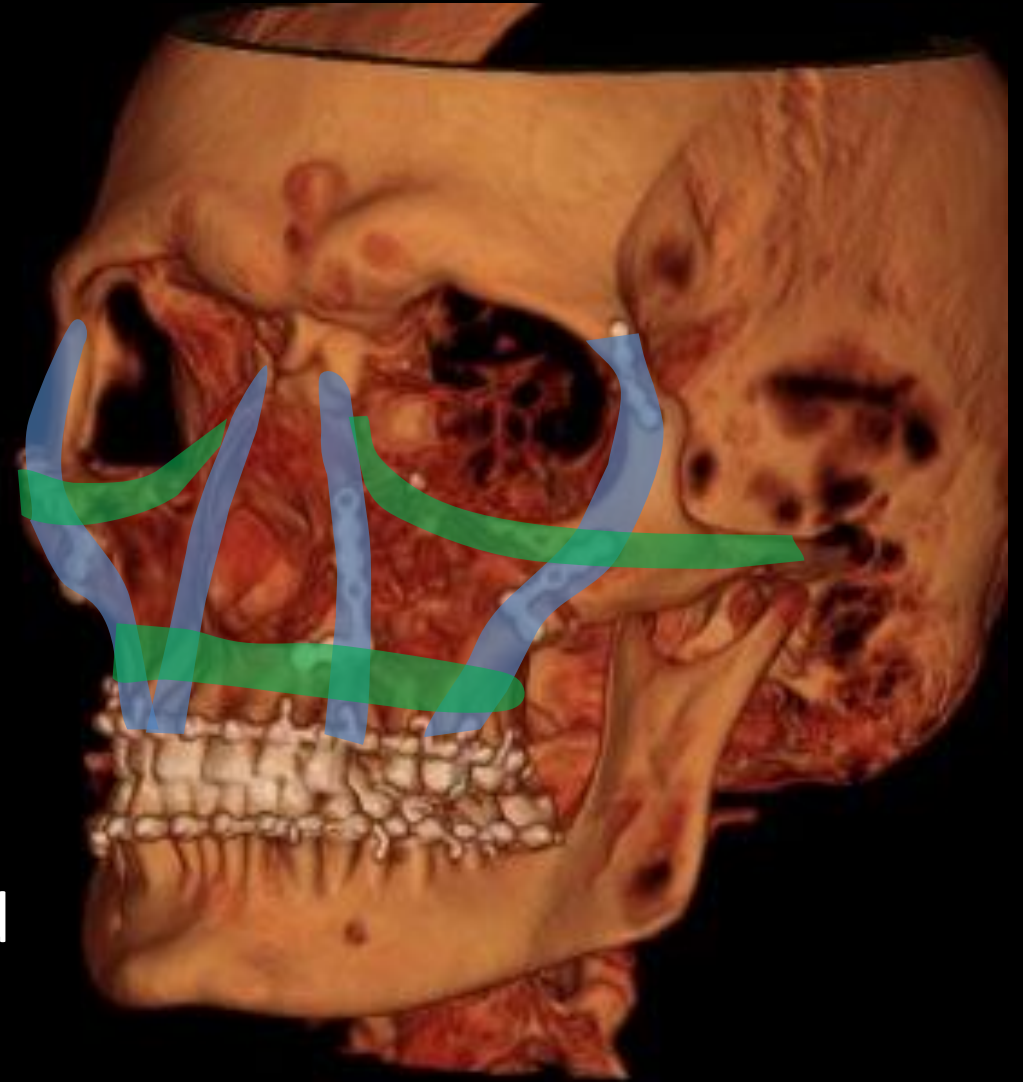
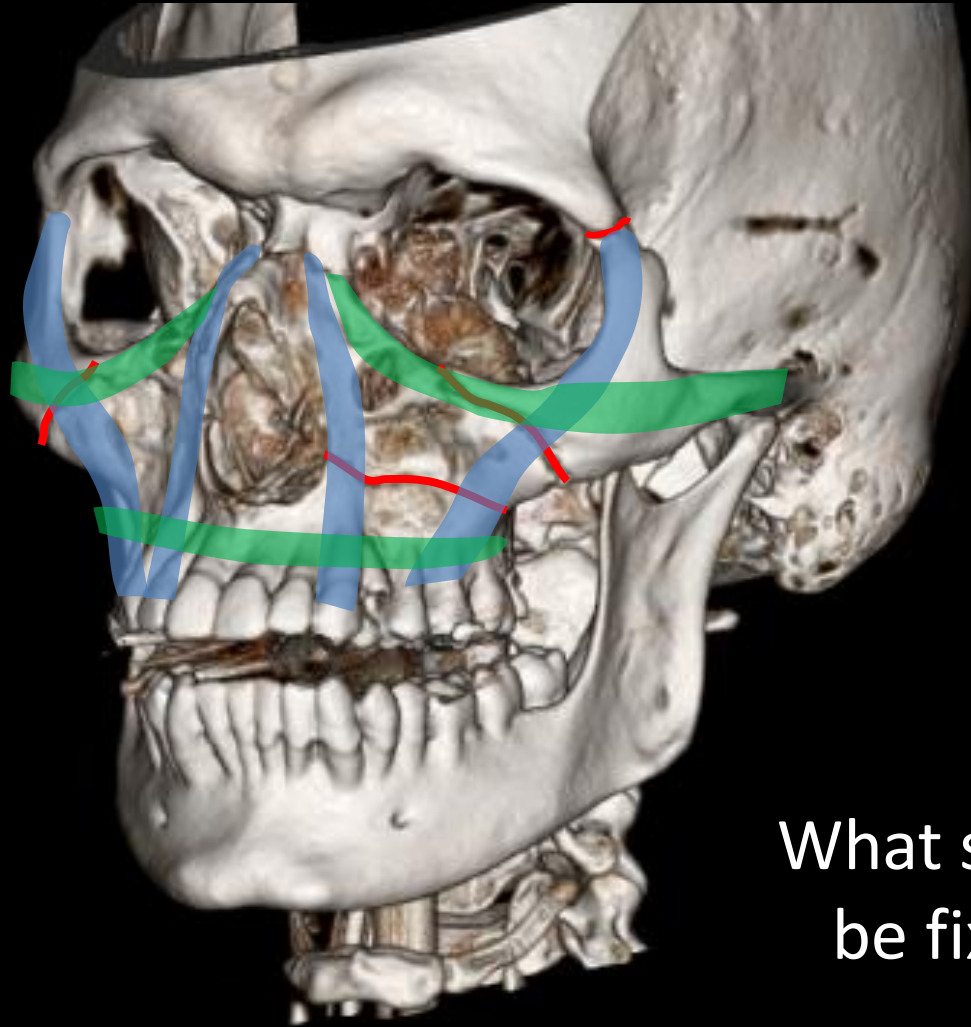
Buttresses

- Thicker bone = **buttress**
- Thinner bone = **wall**



Buttresses →

Define shape
Distribute force



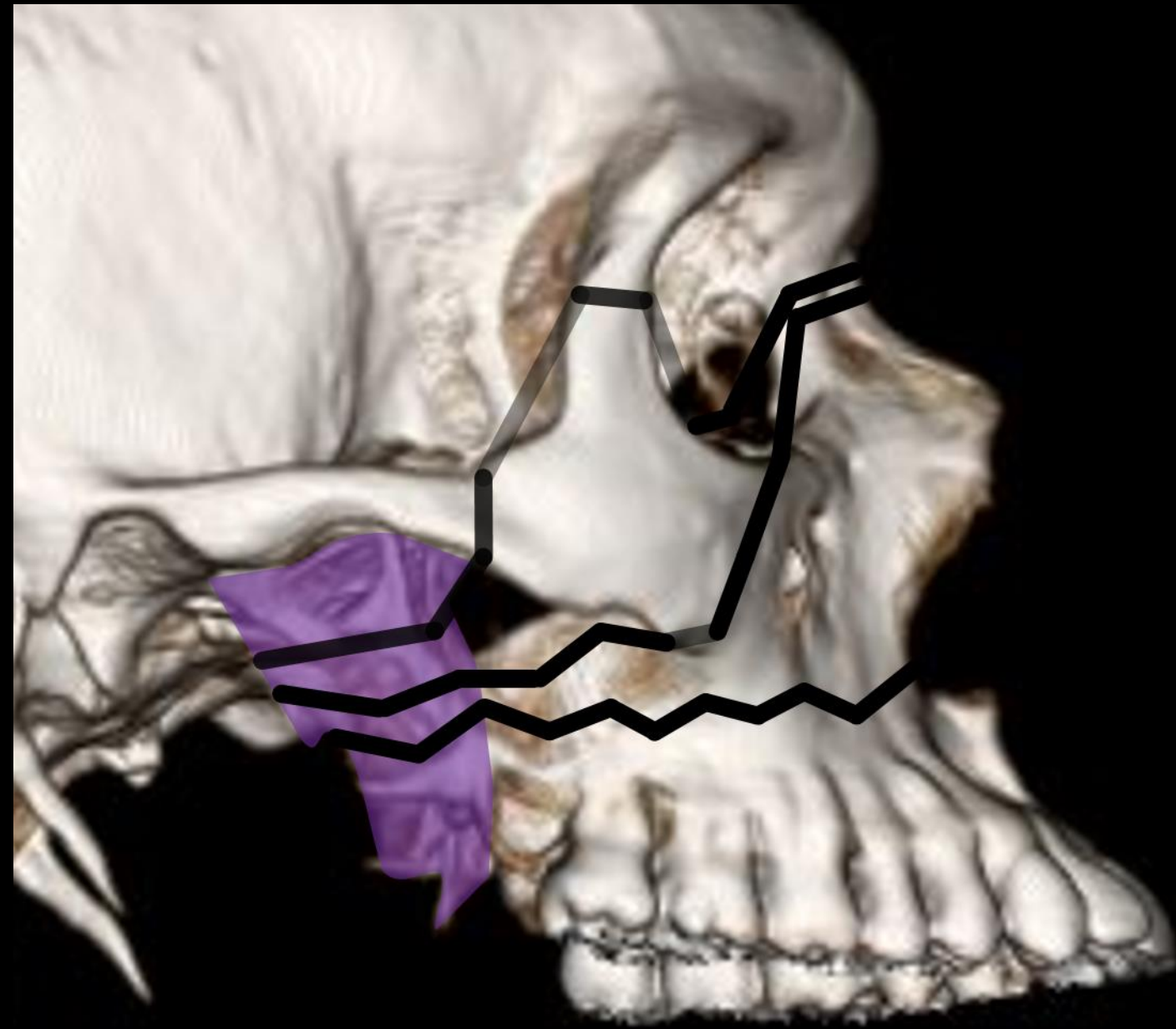
What should
be fixed?

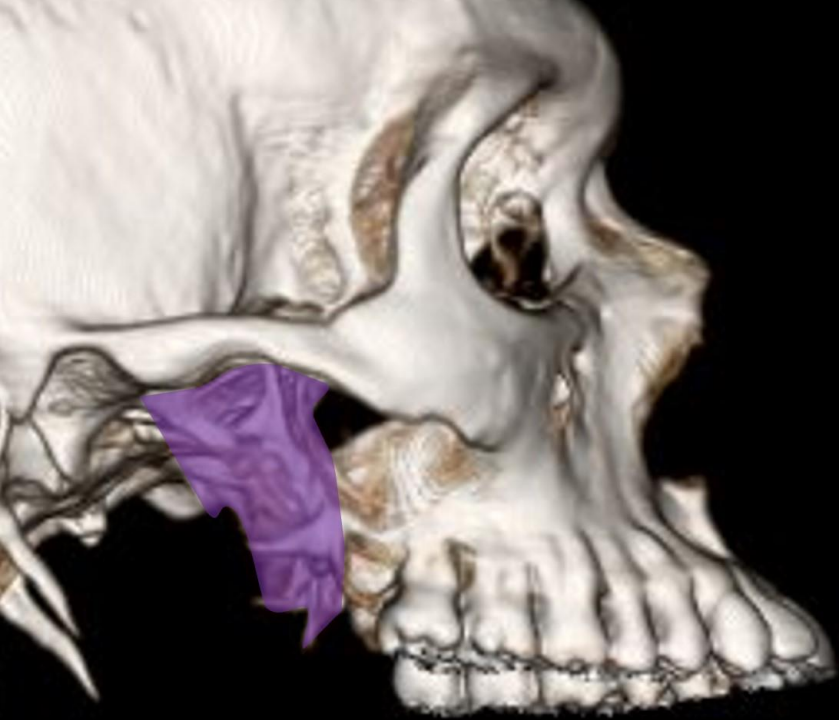
Buttresses

Those thicker pieces of bone that...

- Form and function
- Provide soft tissue support
- Surgical planning!







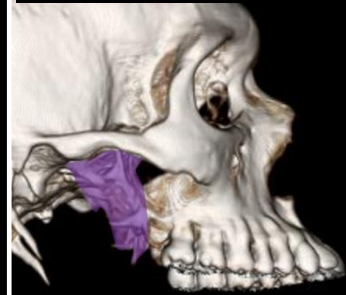
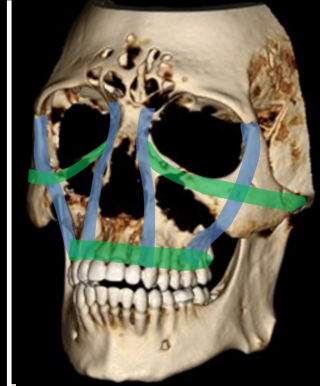
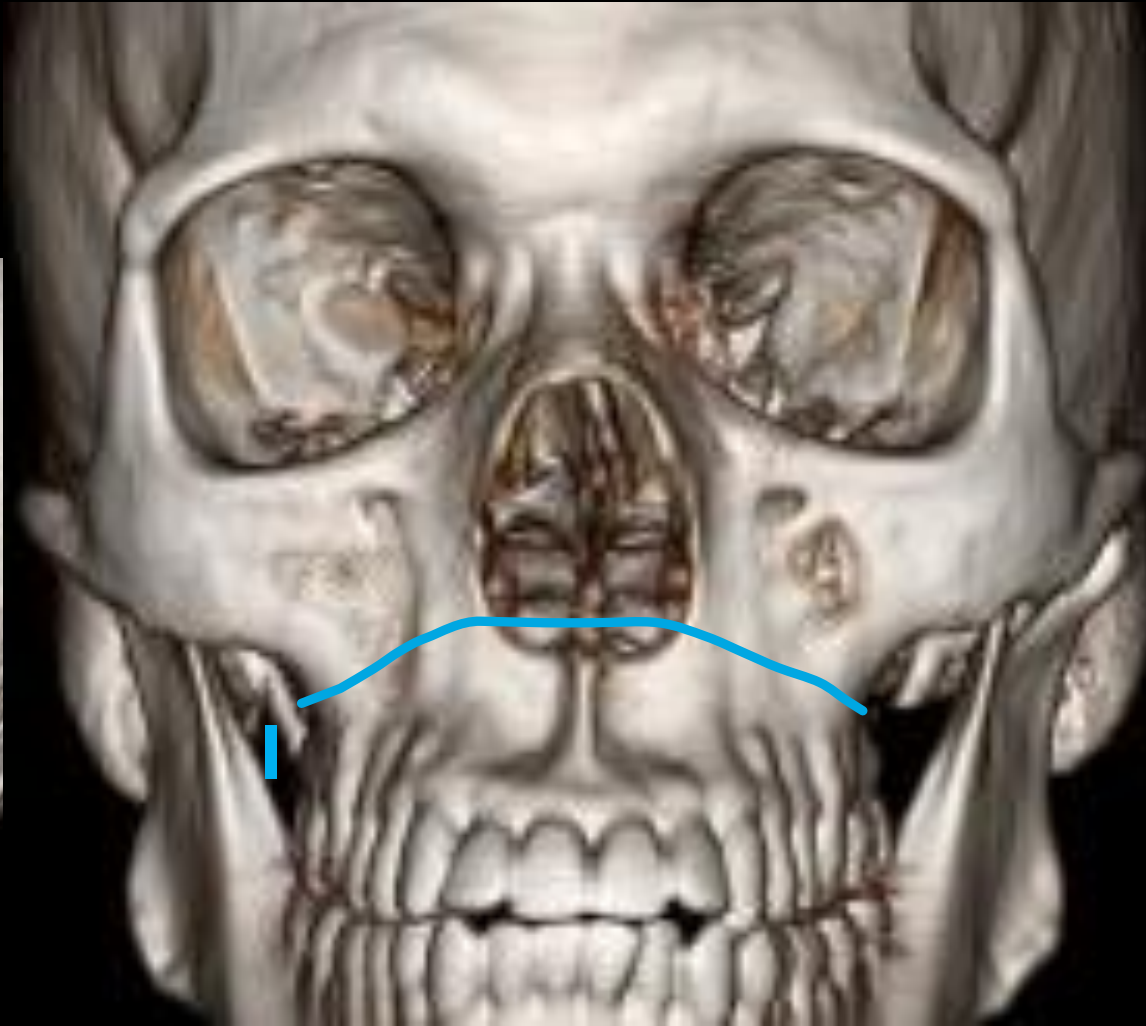
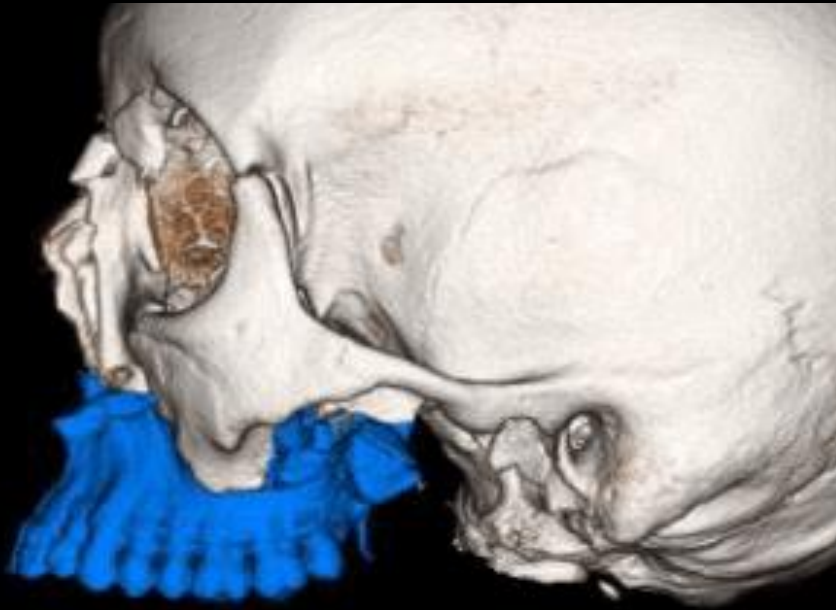
Pterygoid plates => Le Fort

Le Fort => Pterygoid Plates

Le Fort Classification

Horizontal fracture
Starts at the piriform aperture
Think coronal CT image

Le Fort I

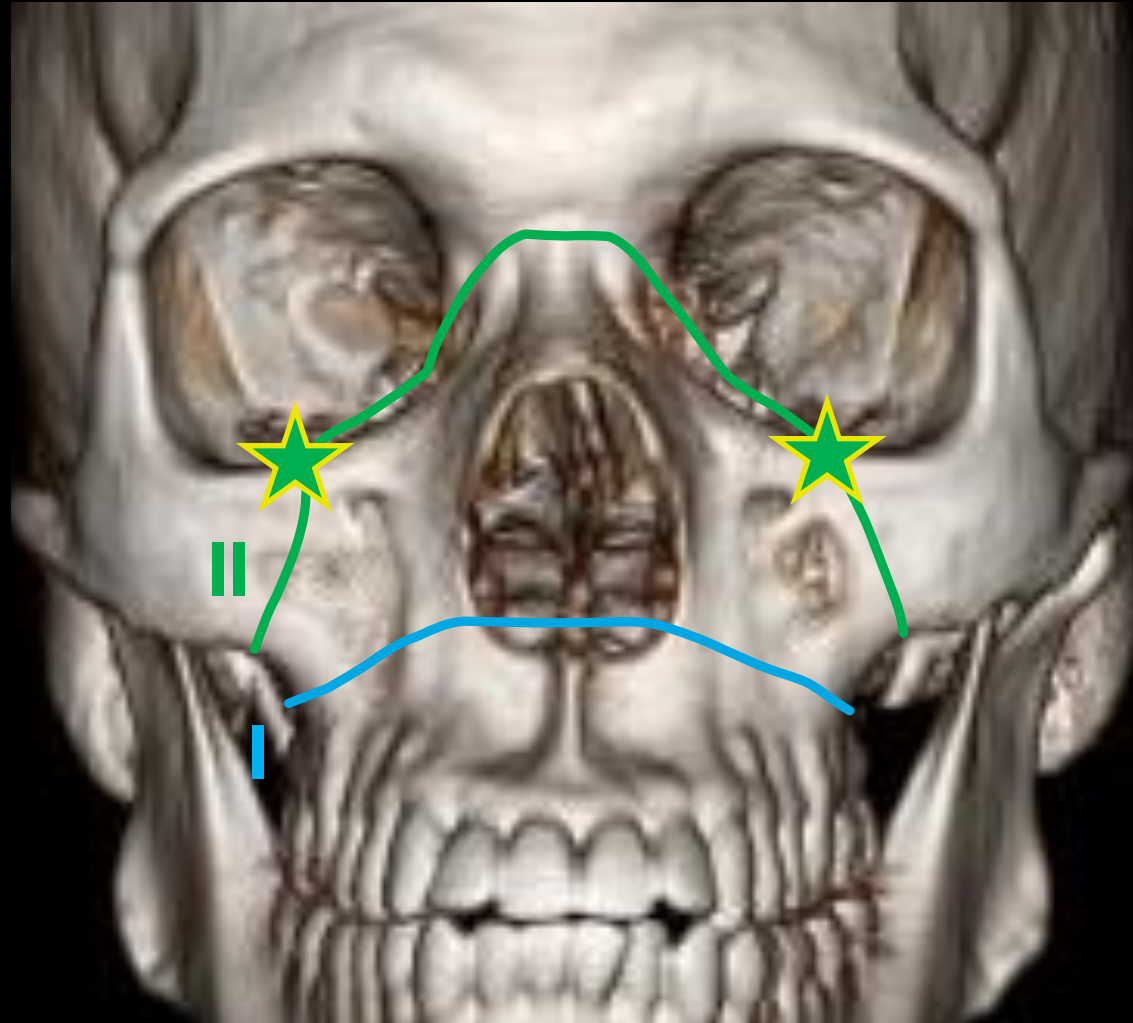
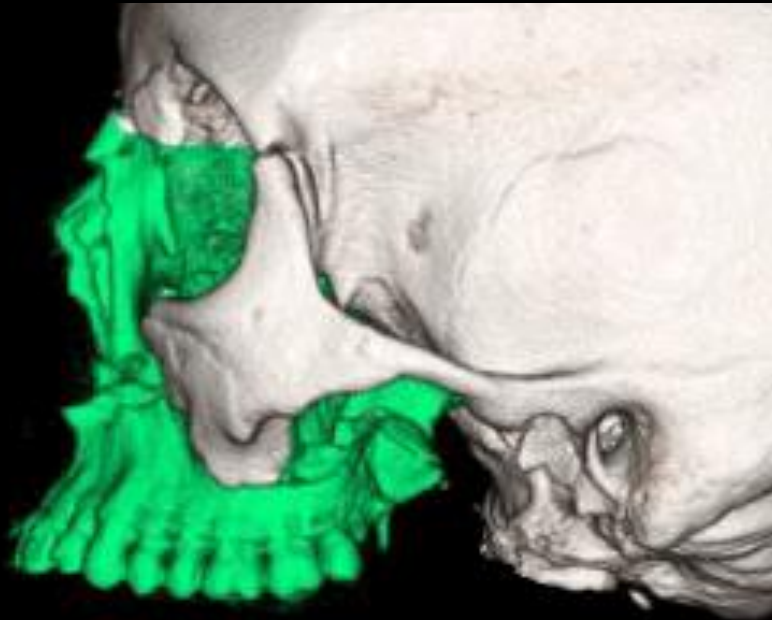


Free fragment not a line!

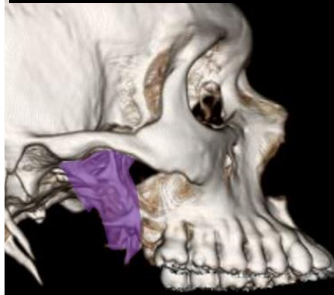
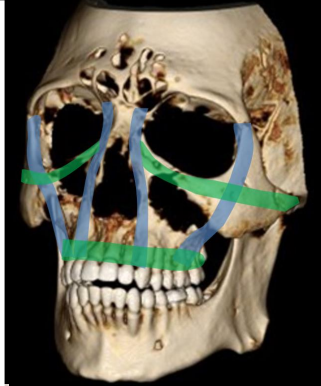
Le Fort Classification

What can we use to tell us it's a II?

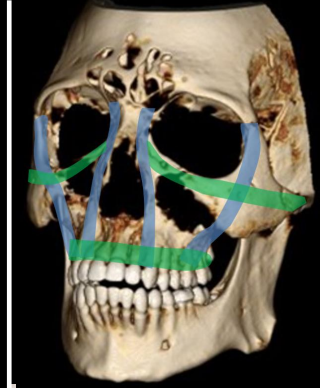
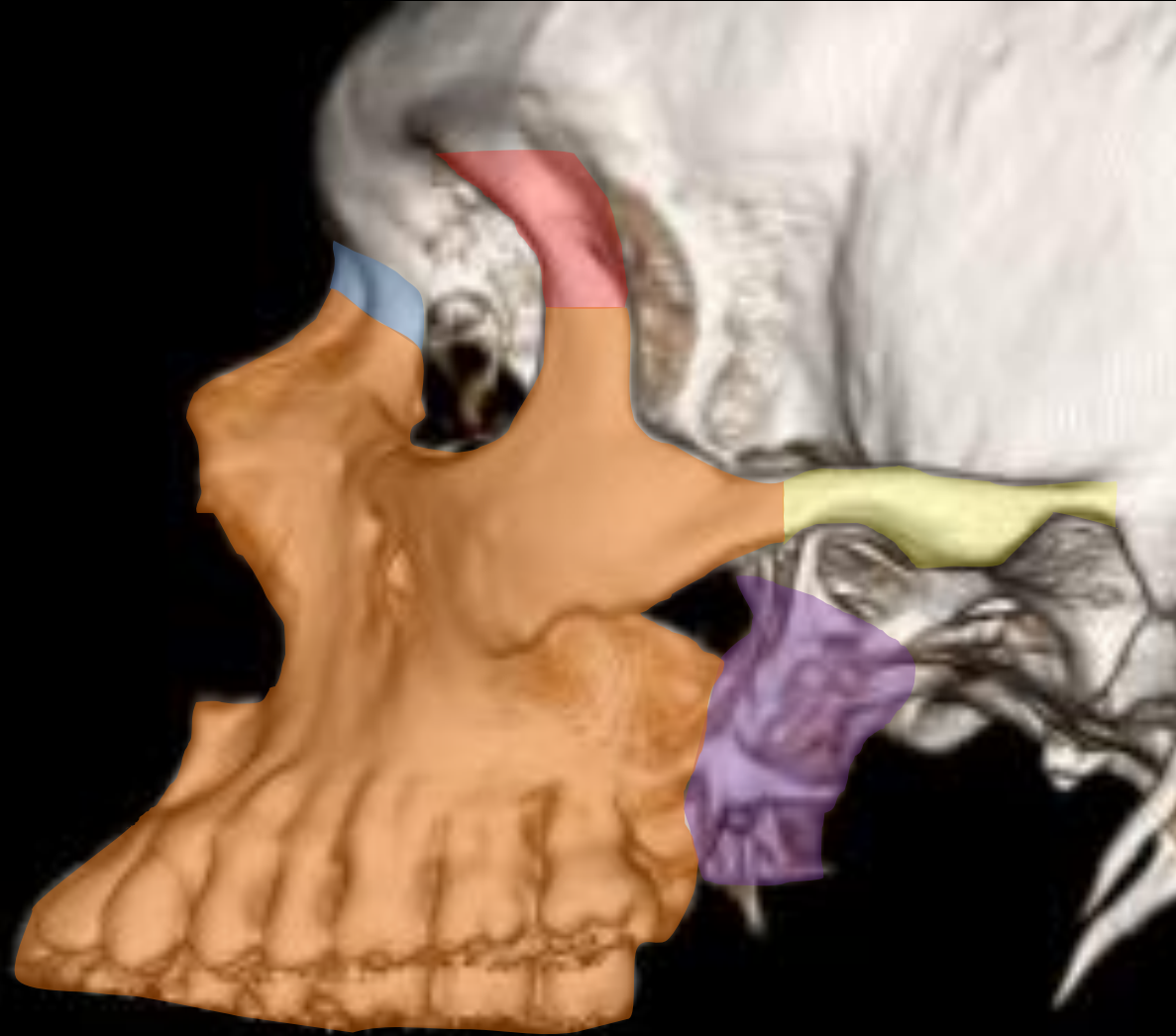
Le Fort II



Inferior Orbital Rim fracture

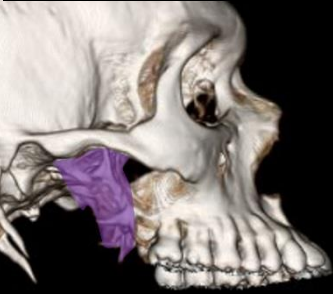
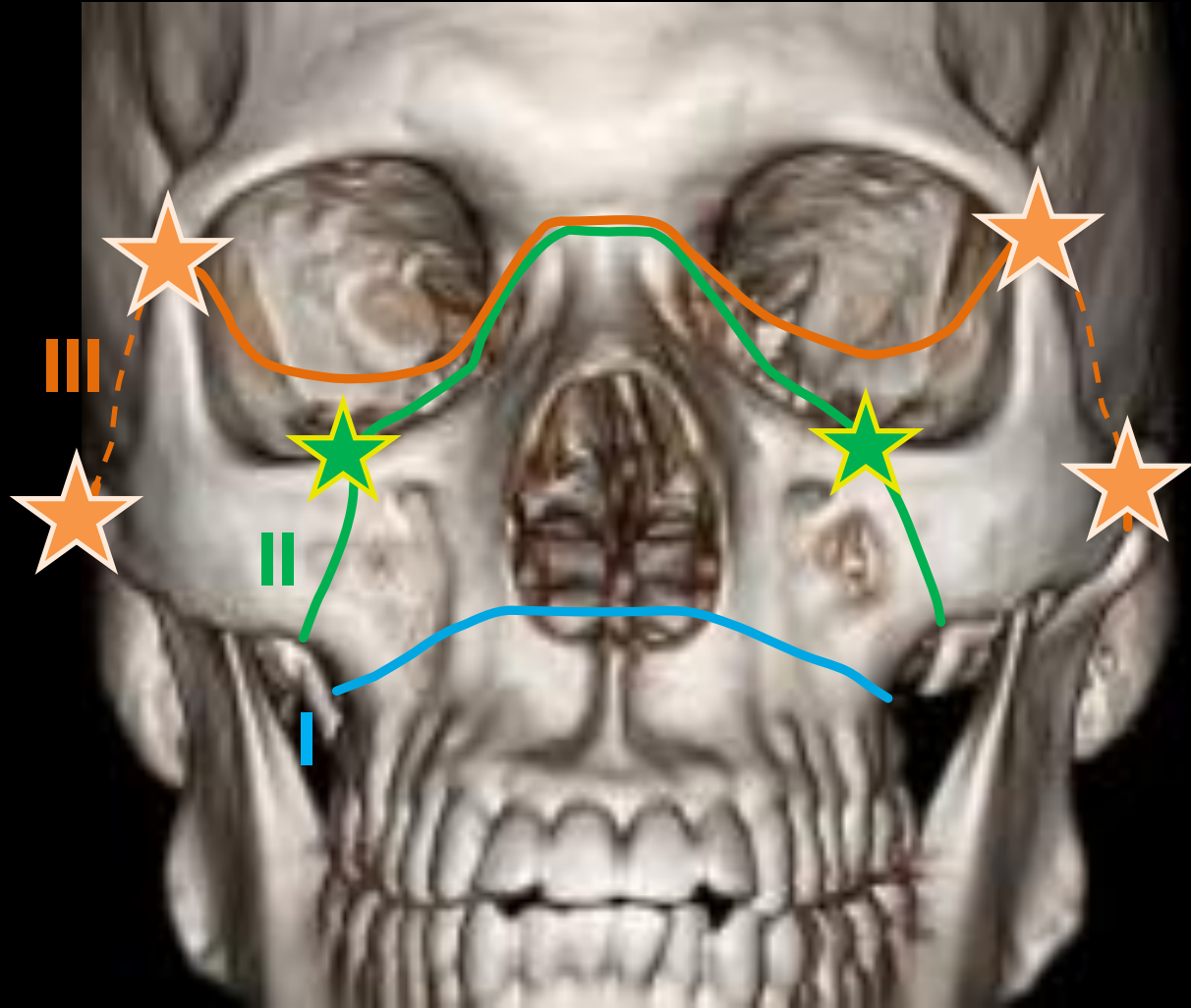
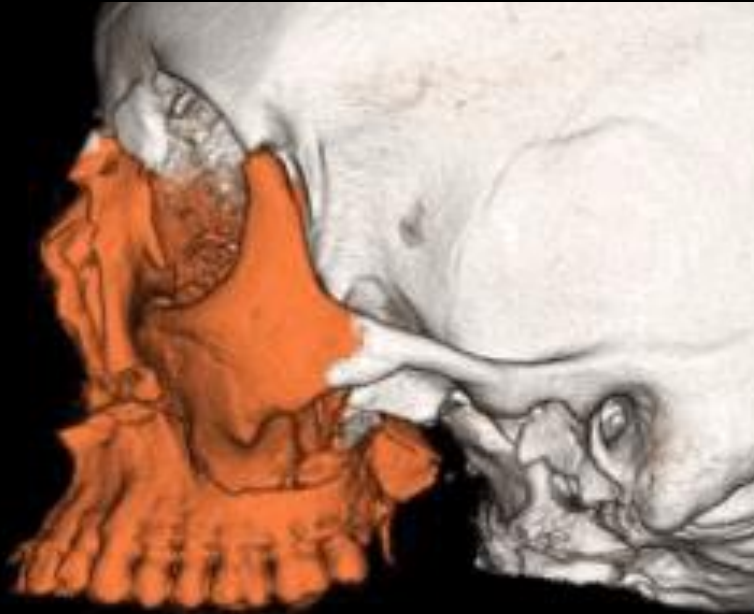


Le Fort III: Detachment of the Entire Midface from the Skull



Le Fort Classification

Le Fort III



Le Fort Classification

Pterygoid plate fracture

Le Fort I:

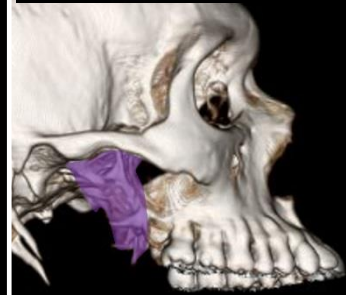
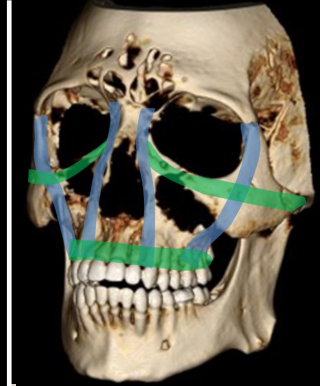
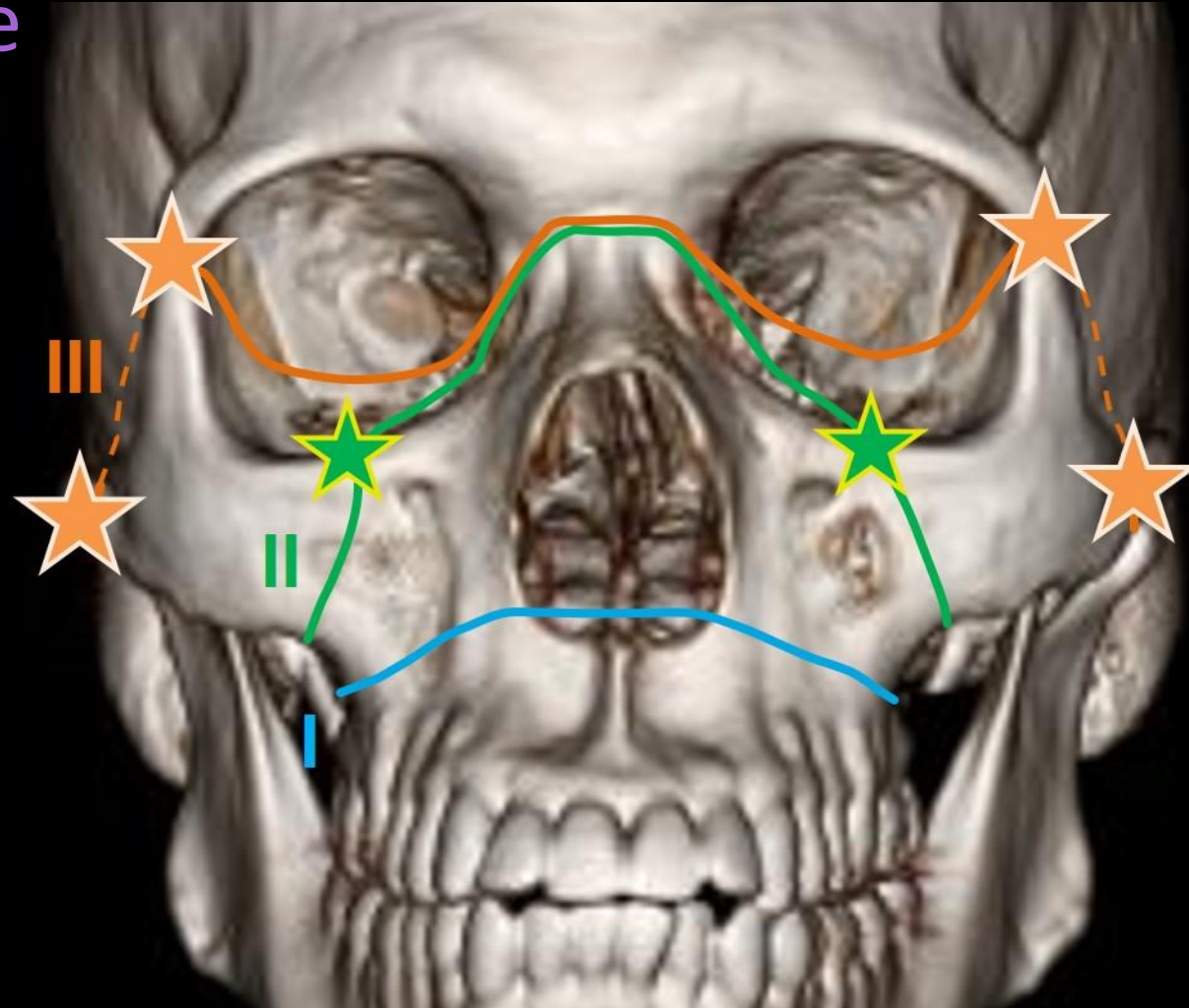
- Transverse fracture through the maxilla

Le Fort II:

- Inferior orbital rim

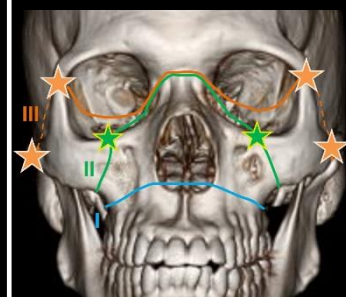
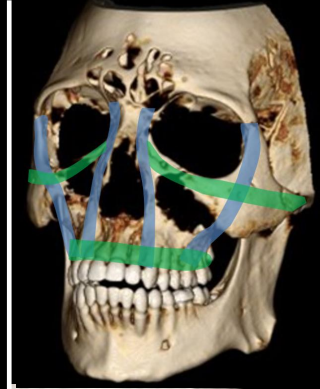
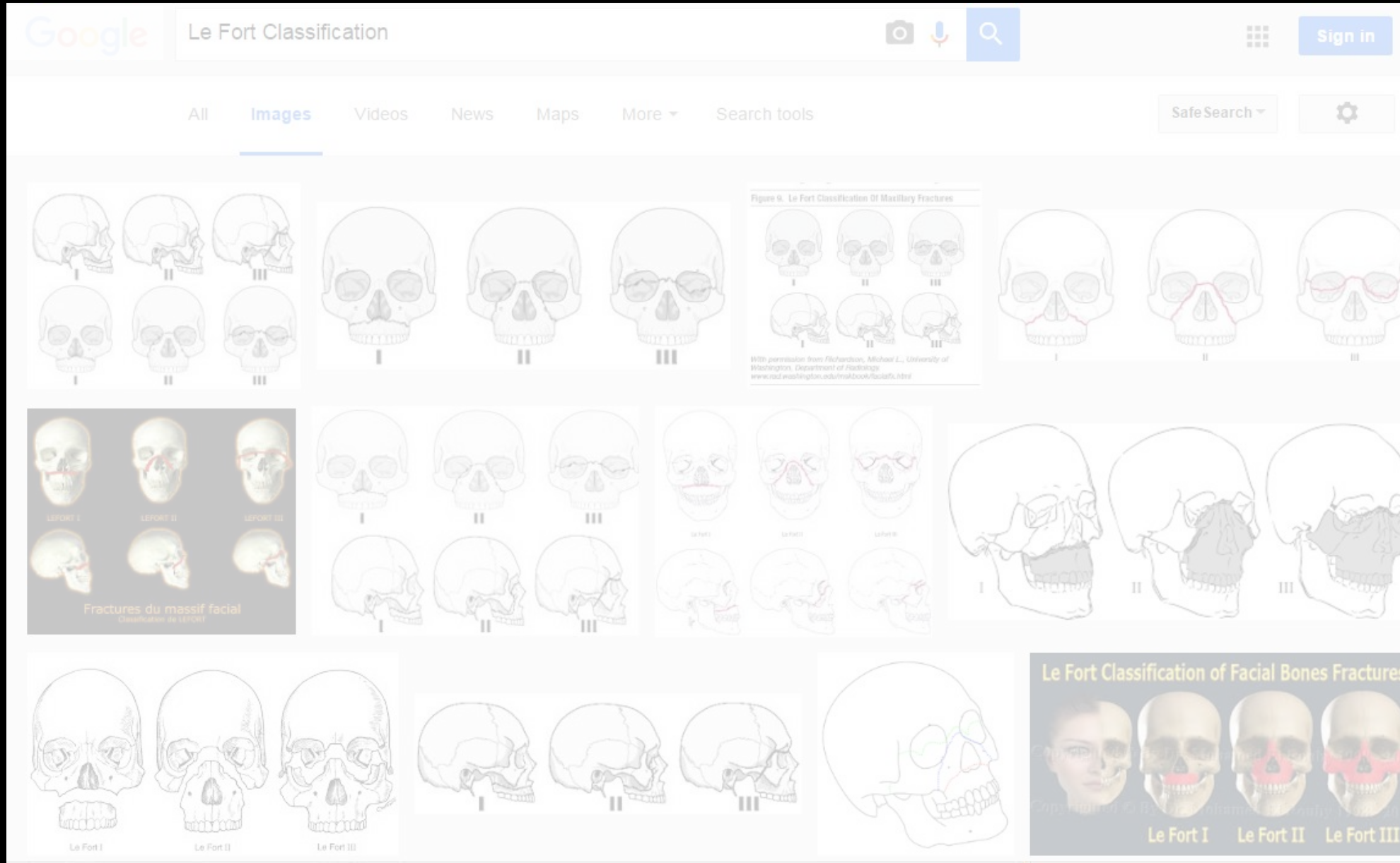
Le Fort III:

- Lateral orbital wall
- Zygomatic arch

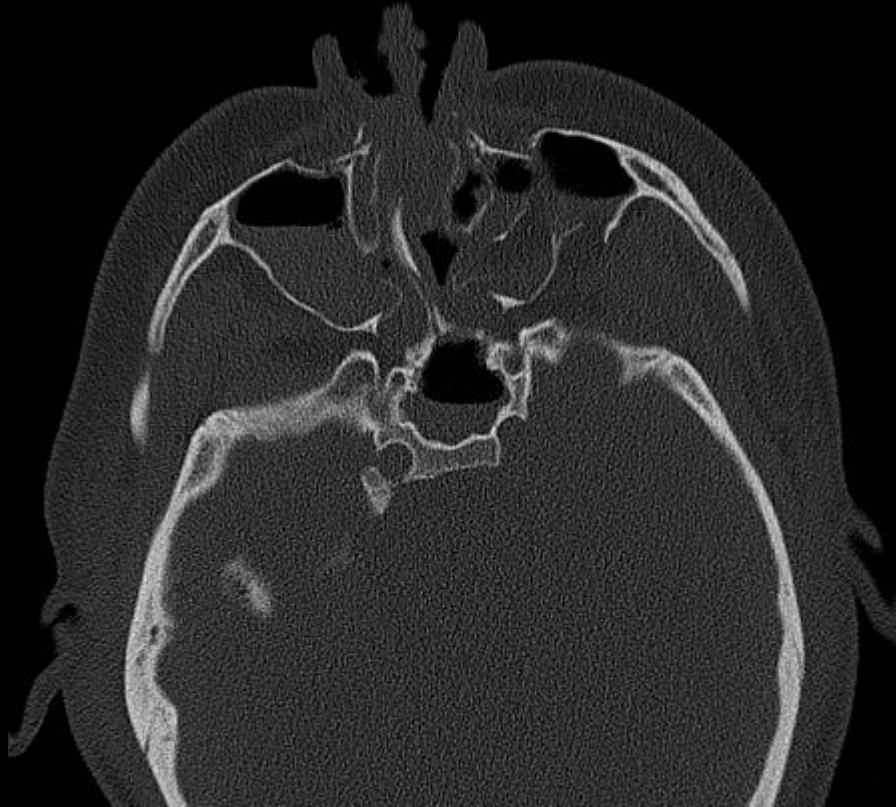


Pterygoid plate fracture → Search for Le Fort

*Remember the features that distinguish the different types

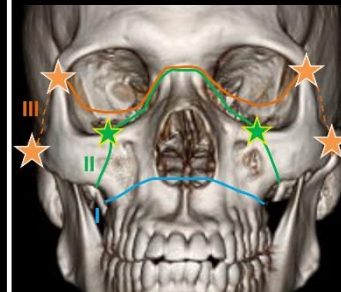
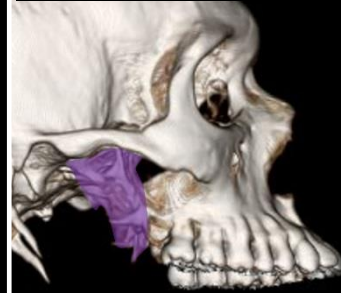
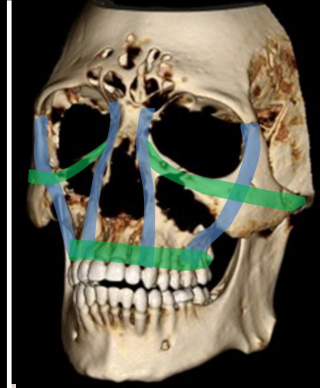


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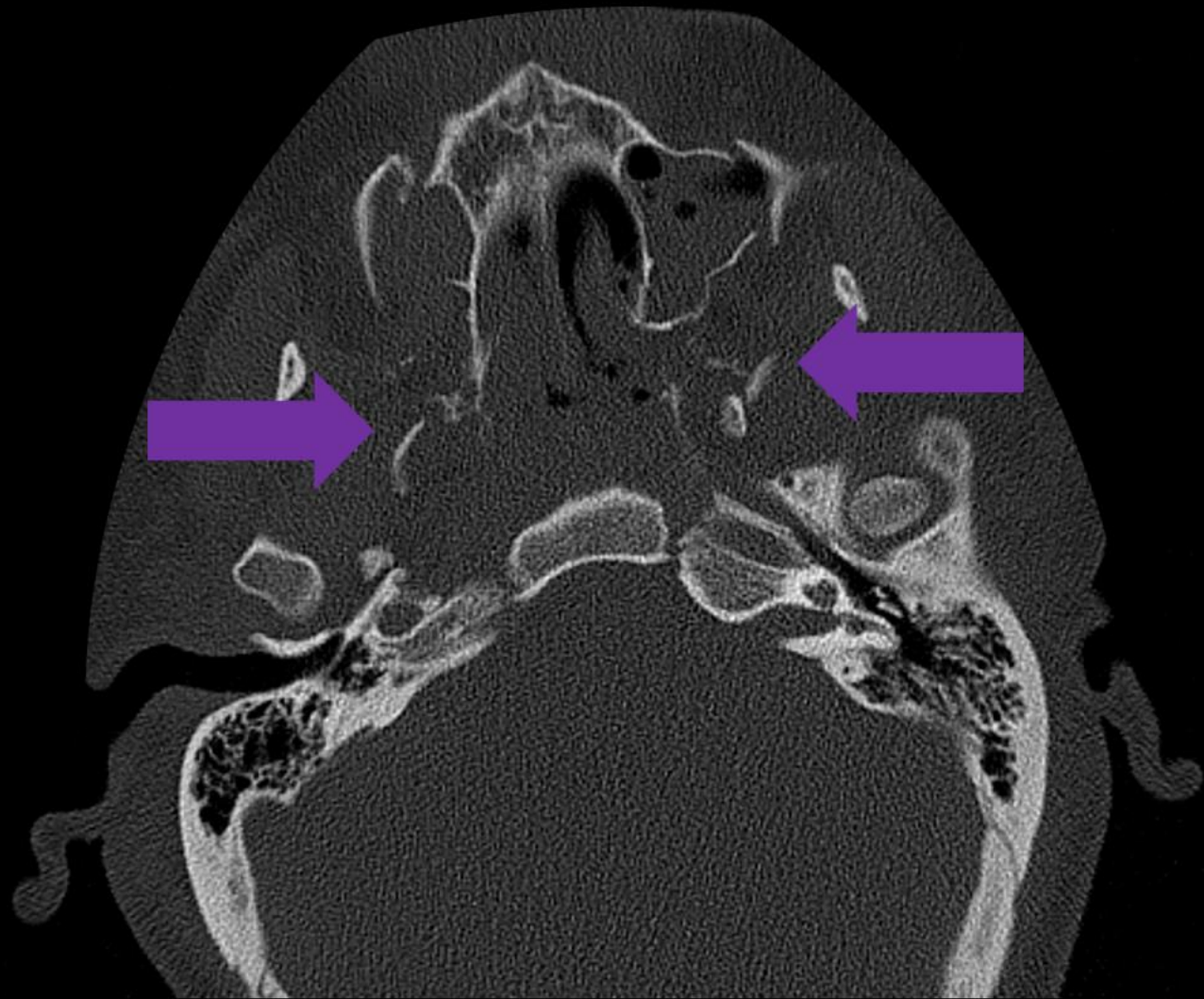


IMPRESSION. Extensive facial fractures, including:

1. Left medial orbital wall fracture
2. Left inferior orbital rim fracture
3. Left lateral orbital wall fracture
4. Left and right maxillary fracture
5. Left zygomatic arch fracture
6. Bilateral pterygoid plate fractures
7. Bilateral nasal bone fracture
8. Right medial orbital wall fracture
9. Right inferior orbital rim fracture
10. Inner and outer table frontal sinus fractures

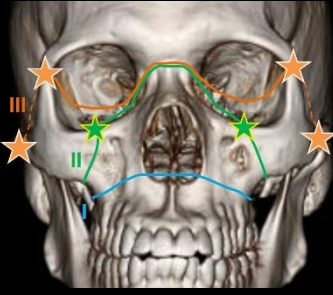
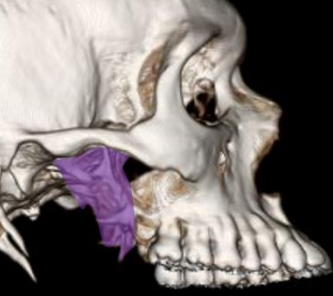
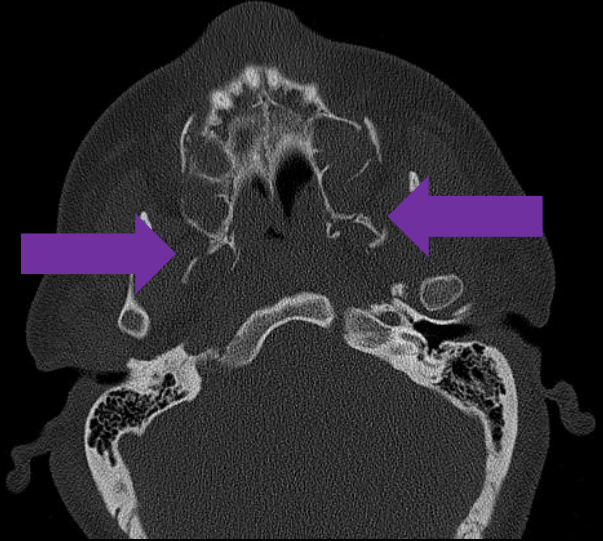
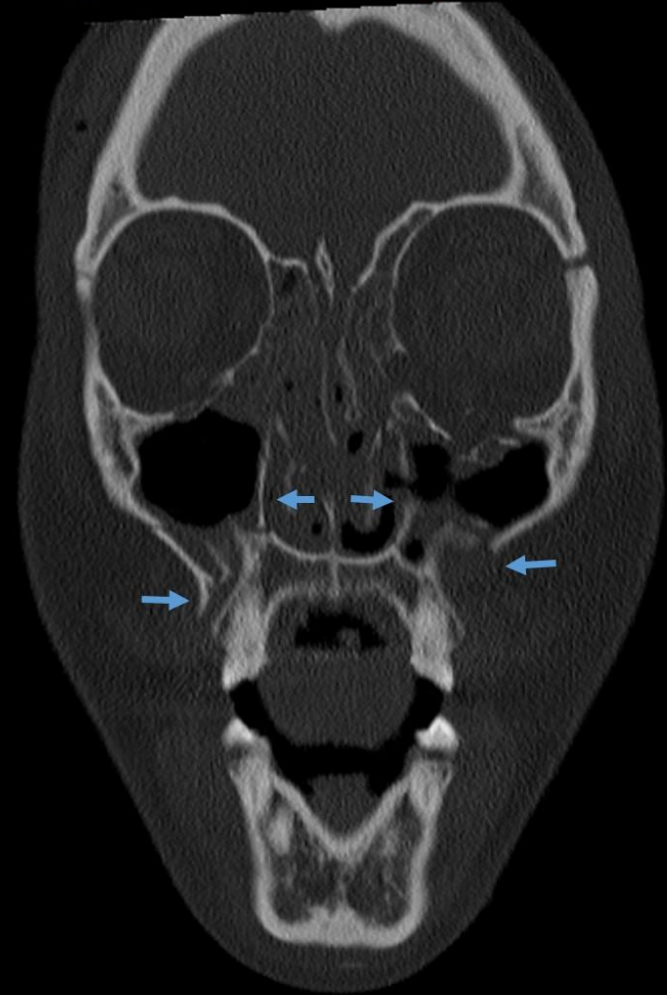
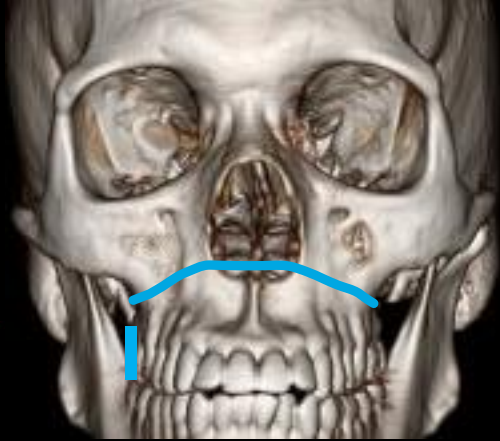


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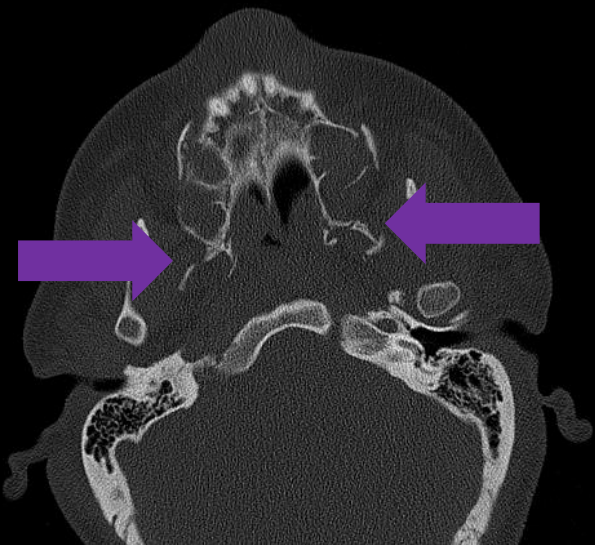
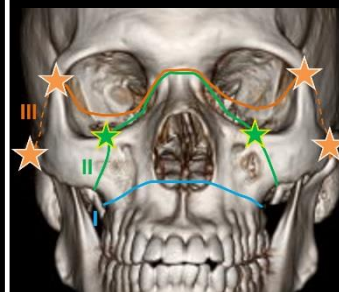
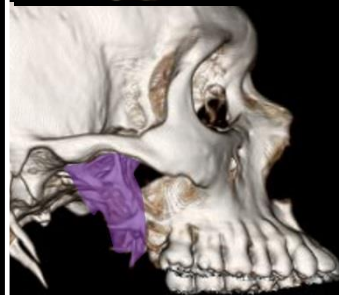
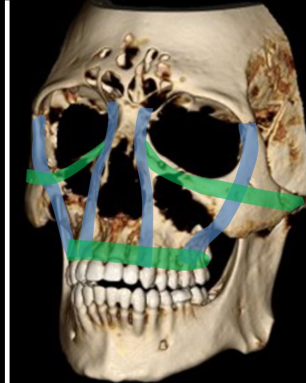
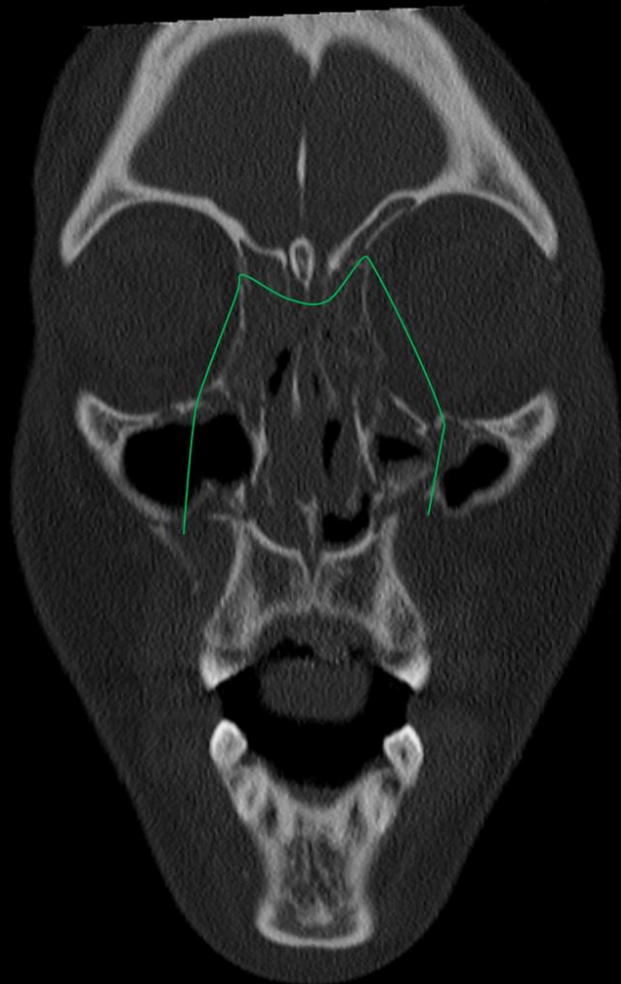
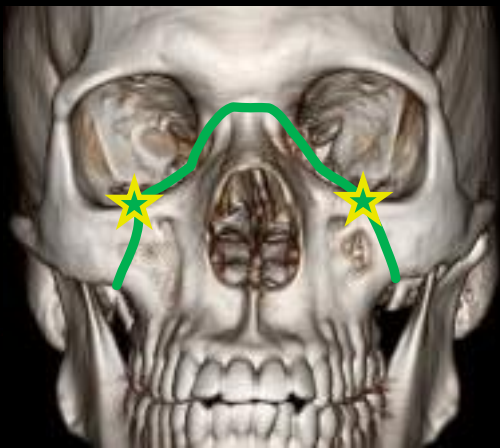


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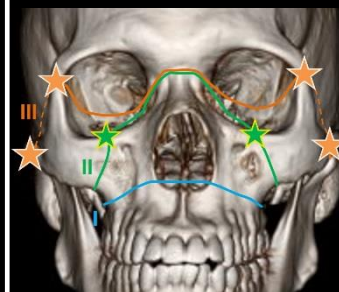
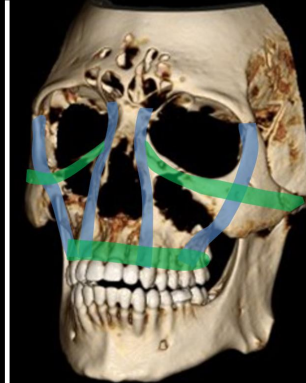
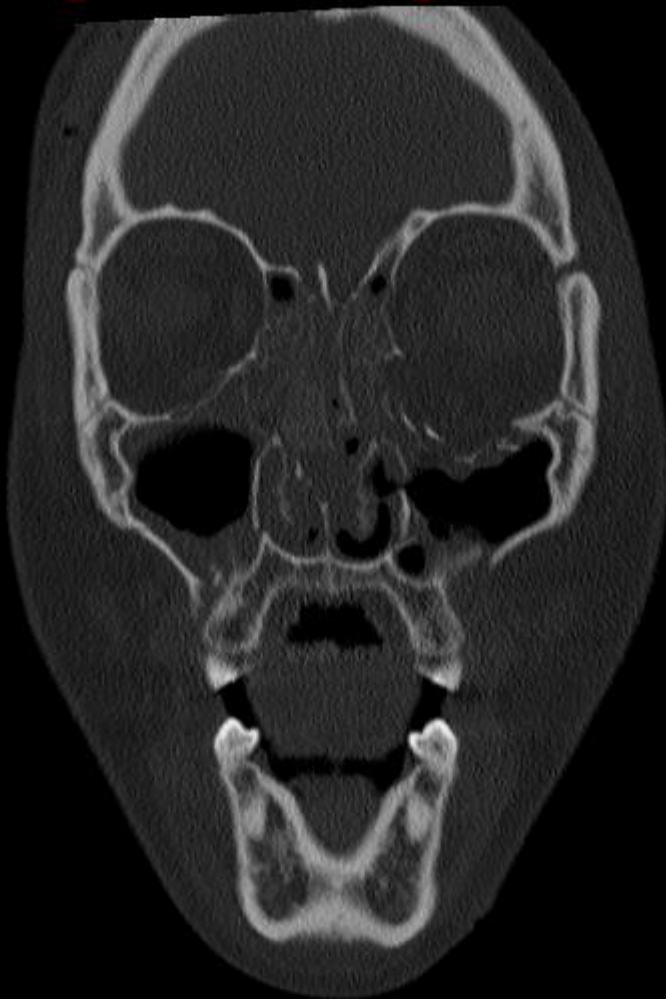
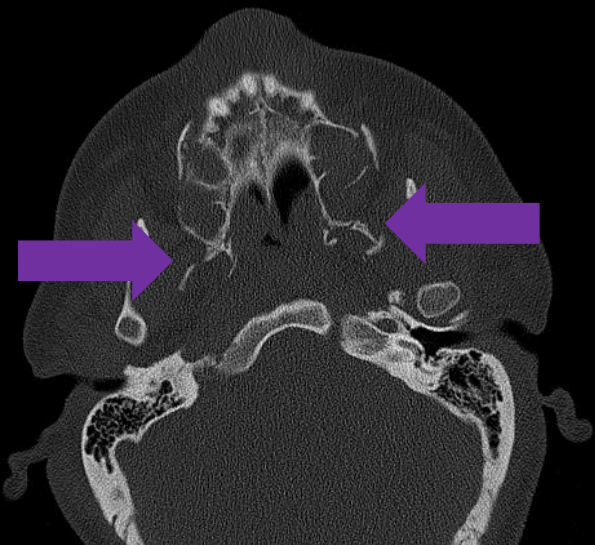
Think trauma CT
One thing at a time



2



3



Spectrum of Critical Imaging Findings in Complex Facial Skeletal Trauma¹

Blair A. Winegar, MD • Horacio Murillo, MD, PhD • Bundhit Tantiwongkosi, MD

SA-CME

See www.rsna.org/education/learn/rg

LEARNING OBJECTIVES FOR TEST 1

After completing this journal-based SA-

Multidetector computed tomography (CT) is the modality of choice for the evaluation of facial trauma because it helps accurately identify and characterize fractures and associated complications, thereby aiding timely clinical management and surgical planning. In particular, CT clearly depicts clinically relevant fractures in the eight osseous struts or buttresses that function as an underlying scaffold for facial

Teaching Point

Le Fort described three common fracture patterns, each caused by a force of a different magnitude and all including a fracture through the pterygoid plates (Fig 3). Depending on the distribution of forces through the facial skeleton, multiple Le Fort fracture patterns may occur at the same time, and different combinations may occur on the two sides of the face (eg, type I and II fractures on the left side, and type II and III fractures on the right).

Complications of facial trauma.

TEACHING POINTS

See last page

maxillofacial complex fractures, which disrupt all four zygomatic sutures and may lead to enophthalmos due to increased orbital volume because of angulation of the lateral orbital wall; orbital “blowout” fractures, which may result in extraocular muscle herniation or entrapment and injuries to the globe or the infraorbital nerve; and fractures of the alveolar process, which are treated as open fractures because of their extension through the gingiva to the oral cavity and their resultant vulnerability to infection. Similarly, extension of a frontal sinus fracture through the posterior sinus wall creates a portal to the anterior cranial fossa and may lead to cerebrospinal fluid leakage, intracranial hemorrhage, or intracranial infection.

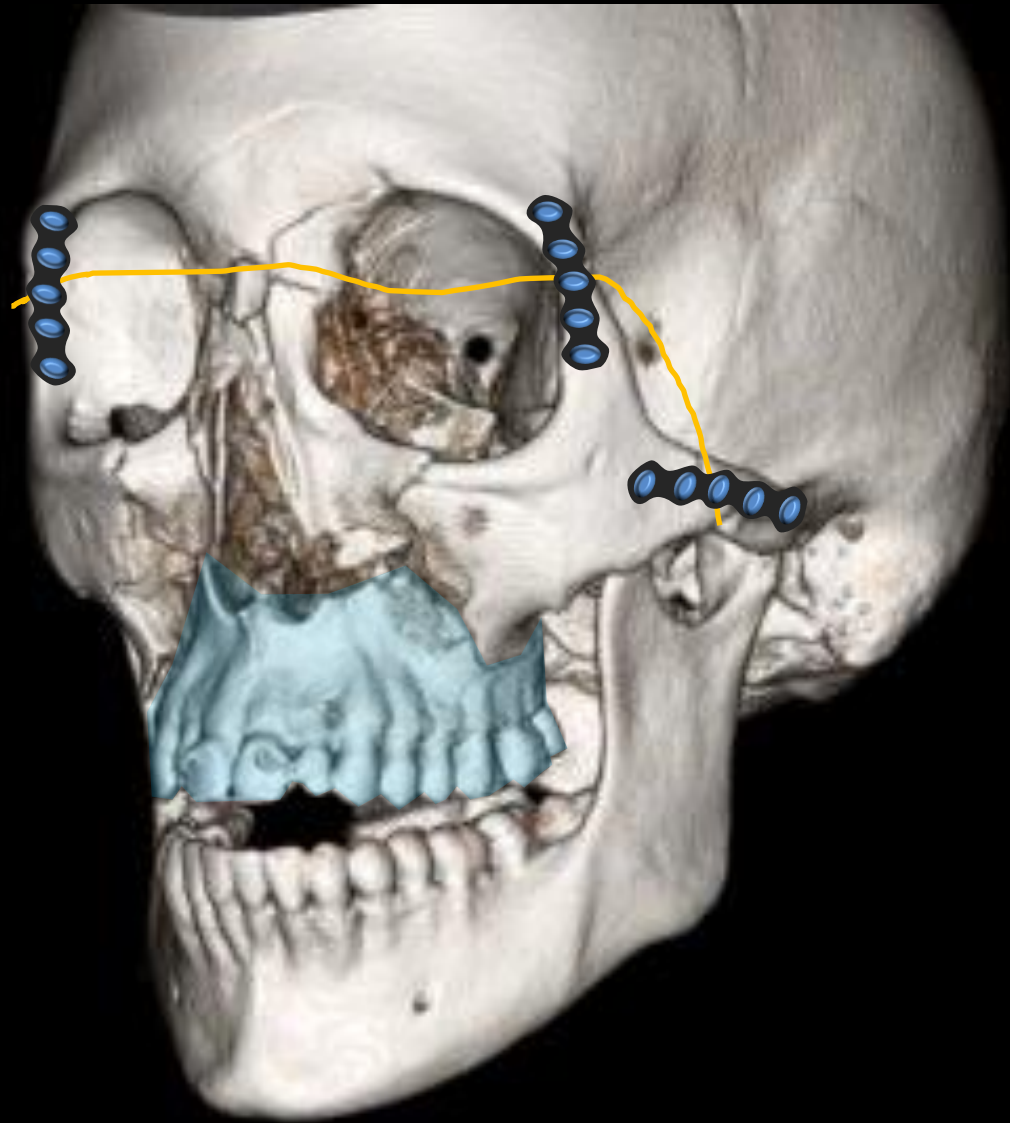
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Abbreviations: CSF = cerebrospinal fluid, NOE = naso-orbitoethmoid

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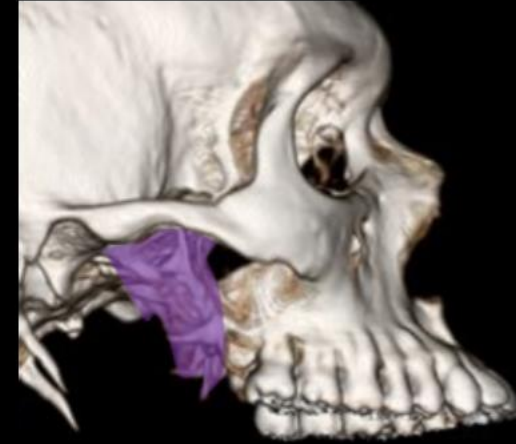
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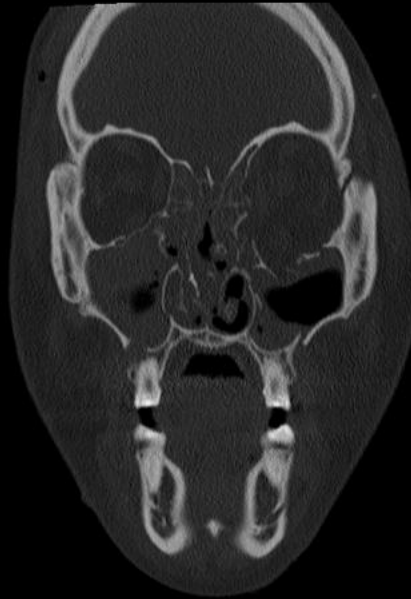
SUMMARY – Le Fort



Buttresses distribute force.
These are what will be **fixed**.



If the **pterygoid plates** are broken,
you're looking for a Le Fort fracture



The **coronals** are your friend in
making the specific diagnosis

1 • 2 • 3

Have a logical search pattern. Only
look for **one type of Le Fort at a time**



Use **key fractures** to work out
which Le Fort you're dealing with